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CLAIMS

What is claimed is:

1. A railcar-moving vehicle comprising:

a modified semi-tractor, selectively reconfigurable for operation either on or off

5 rails, having rubber-tired drive wheels configured to contact the rails;

a load-shifting device, rearwardly disposed on the modified semi-tractor,
having a raised position and a lowered position, and including rearward rail wheels
configured to contact the rails when in the lowered position;

10 a lifting coupler, moveably attached to the load-shifting device above the
rearward rail wheels, configured to couple to a coupler of a railcar; and

an air bag suspension system, including air bags configured to support the
modified semi-tractor above the drive wheels, and a coupler airbag disposed below
the lifting coupler, configured to apply an upward force upon the lifting coupler when
inflated with compressed air, so as to transfer a portion of weight of the coupled
15 railcar to the drive wheels of the railcar-moving vehicle.

2. The railcar-moving vehicle as described in claim 1, wherein the upward force
applied on the lifting coupler by the coupler air bags is greater than a downward force applied
on the drive wheels by the air bag suspension system.

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3. The railcar-moving vehicle as described in claim 2, wherein the load-shifting
mechanism is configured to impose an additional portion of weight from the railcar onto the
rearward rail wheels, the additional portion being greater than the portion transferred to the
drive wheels.

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4. The railcar-moving vehicle as described in claim 1, wherein the coupler air bags and the air bag suspension system are configured to have a maximum pressure of about 120 psi.

5 5. The railcar-moving vehicle as described in claim 1, wherein the lifting coupler is configured to move substantially vertically from a first position to a second higher position.

6. The railcar-moving vehicle as described in claim 5, further comprising
10 parallel arms, hingedly attached to the lifting coupler, configured to maintain the orientation of the lifting coupler relative to the coupler of the railcar when moving between the first position and the second position.

7. The railcar-moving vehicle as described in claim 1, further comprising a fifth
15 wheel connector rearwardly disposed on the vehicle, configured for connection to a highway trailer.

8. The railcar-moving vehicle as described in claim 1, wherein the lifting coupler is moveably attached to the load-shifting device forward of the rearward rail wheels and
20 rearward of a location of connection of the load-shifting device to the vehicle, such that a portion of the weight of the railcar will be transferred to the vehicle if the load shifting device pivots with respect to the frame.

9. The railcar-moving vehicle as described in claim 8, wherein the lifting coupler
25 is attached to the load shifting device at a point from about 8" to 12" forward of the rearward rail wheels.

10. The railcar-moving vehicle as described in claim 1, wherein the lifting coupler further comprises a horizontal support plate, and a knuckle body pivotally connected to the horizontal support plate, the knuckle body being configured to lock with the coupler of the
5 railcar.

11. The railcar-moving vehicle as described in claim 1, further comprising a retaining bracket, hingedly attached to an upper side of the rearward portion of the vehicle frame, and configured to hold the lifting mechanism in the raised position during highway
10 use of the vehicle.

12. A load-shifting device for shifting a portion of weight of a railcar to a railcar-moving vehicle having a vehicle frame, rubber-tired wheels for driving on a roadway, including drive wheels, and retractable railroad wheels configured to guide and support the
15 vehicle on rails, the rubber-tired drive wheels being rearwardly disposed on the vehicle frame and configured to contact the rails, and having an air bag suspension system supporting the vehicle frame above the drive wheels, the load-shifting device comprising:

a moveable frame, pivotally disposed on a rearward extremity of the vehicle frame, having a raised position and a lowered position, configured to be substantially
20 rigidly fixed with respect to the vehicle frame when in the lowered position;

rearward rail wheels disposed on the moveable frame, configured to contact the rails rearwardly of the drive wheels when the moveable frame is in the lowered position;

a lifting coupler, attached to the moveable frame above the rearward rail
25 wheels, configured to couple to a coupler of a railcar; and

a coupler airbag, disposed below the lifting coupler, configured to inflate with compressed air concurrently with the air bag suspension system, such that the coupler air bag and air bag suspension system simultaneously apply upward force upon the coupler of a coupled railcar and downward force on the drive wheels, so as to transfer a portion of weight of the railcar to the drive wheels of the railcar-moving vehicle.

13. The load-shifting device as described in claim 12, wherein the upward force applied on the lifting coupler by the coupler air bags is greater than the downward force applied on the drive wheels by the air bag suspension system.

14. The load-shifting device as described in claim 13, wherein the load-shifting mechanism is configured to impose a portion of the load transferred from the railcar onto the rearward rail wheels that is greater than a portion transferred to the drive wheels.

15. The load-shifting device as described in claim 12, wherein the coupler air bags and the air bag suspension system are configured to have a maximum pressure of about 120 psi.

16. The load-shifting device as described in claim 12, wherein the lifting coupler is configured to move substantially vertically from a first position to a second higher position.

17. The load-shifting device as described in claim 16, further comprising parallel arms, hingedly attached to the lifting coupler, configured to maintain the orientation of the lifting coupler relative to the coupler of the railcar when moving between the first position and the second position.

18. The load-shifting device as described in claim 12, wherein the railcar-moving vehicle further comprising a fifth wheel connector rearwardly disposed on the vehicle frame and configured for connection to a highway trailer.

5 19. The load-shifting device as described in claim 12, wherein the lifting coupler is moveably attached to the moveable frame forward of the rearward rail wheels and rearward of a location of the pivotal connection of the moveable frame, such that a portion of the weight of the railcar will be transferred to the frame of the vehicle if the moveable frame pivots with respect to the frame.

10 20. The load-shifting device as described in claim 19, wherein the lifting coupler is attached to the moveable frame at a point from about 8" to 12" forward of the rearward rail wheels.

15 21. The load-shifting device as described in claim 12, wherein the lifting coupler further comprises a horizontal support plate, and a knuckle body pivotally connected to the horizontal support plate, the knuckle body being configured to lock with the coupler of the railcar.

20 22. The load-shifting device as described in claim 12, further comprising a retaining bracket, hingedly attached to an upper side of the rearward portion of the vehicle frame, and configured to hold the moveable frame in the raised position during highway use of the vehicle.

25 23. A method of shifting a portion of weight of a railcar to a railcar-moving vehicle, said method comprising the steps of:

- a) providing a railcar-moving vehicle comprising a modified semi tractor, having a frame, rubber-tired wheels for driving on a roadway, including drive wheels, and retractable railroad wheels configured to guide and support the vehicle on rails, including rearward railroad wheels, the rubber-tired drive wheels being rearwardly disposed on the frame and configured to contact the rails, and having an air bag suspension system supporting the frame above the drive wheels, a load-shifting device, pivotally disposed on the frame rearwardly of the drive wheels, having a raised position and a lowered position, the rearward rail wheels being disposed on the load-shifting device and configured to contact the rails when the load-shifting device is in the lowered position, the load-shifting device being configured to be substantially rigidly fixed with respect to the frame when in the lowered position, a lifting coupler, moveably attached to the load-shifting device above the rearward rail wheels, configured to couple to a coupler of a railcar; and a coupler airbag, disposed below the lifting coupler;
- b) coupling the lifting coupler to a coupler of the railcar; and
- c) simultaneously inflating the coupler airbag and the air bag suspension system with compressed air, so as to apply upward force upon the coupler of the railcar and downward force on the drive wheels, and thereby transfer a portion of the weight of the railcar to the drive wheels of the railcar-moving vehicle so as to increase traction of the drive wheels on the rails.